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INDUSTRIAL EFFICIENCY AND THE INTERESTS OF LABOR

Round Table Discussion, **Harlow S. Person, Leader.**

Harlow S. Person: The subject of discussion at this round table conference has been announced in such general terms that there is danger of our minds not meeting. I propose therefore to restate it in a more extended but more definite form. What is or will be the influence on the laborer individually, and on labor as a productive group, of those principles and the accompanying mechanism of management which are associated with the names of Mr. Taylor, Mr. Emerson, and Mr. Gantt, and to which are usually applied the words "Scientific Management"?

William Kent: Mr. Tobin has told us of the case related by Mr. Taylor where the work formerly done by 600 shovelers and other laborers with average wages of $1.15 per day was, after scientific management had been applied to it, accomplished by 140 men whose average earnings were $1.88 per day. Mr. Tobin says that what interests him the most is what became of the 460 men who were displaced. Mr. Taylor accounted for some of them by saying they got jobs for which they were better adapted than for shoveling, at higher wages, in the same works, but he had not kept track of the rest of them.

It is creditable to Mr. Tobin's sympathetic heart that he thinks of the 460 men who were thrown out of a job, but if he thinks they long remained without jobs and that they were sufferers in the long run, he is infected by the fallacy commonly held by the unthinking that the amount of work to be done in the world is a definite and limited amount, and that if either by the use of machinery or by improvement in the method one man is enabled to do the work formerly done by two men, then one of the men is thrown out of work and he and his family are permanently injured.

This fallacy is referred to by Mr. Taylor in his book on Scientific Management, page 13, in the following words. "The great majority of workmen still believe that if they were to work at their best speed they would be doing a great injustice to the whole trade by throwing a lot of men out of work; and yet the history of the development of each trade shows that each improvement, whether it be the invention of a new machine or the introduction of a better method, which results in increasing the productive capacity of the men in the trade and cheapening the costs, instead of throwing men out of work, makes in the end work for more men."

The persistence of this fallacy of the workmen for the past 150 years, ever since the power-driven spinning and weaving machinery began to displace the old spinning wheel and hand loom, and the hand workmen destroyed the machinery and set fire to the mills, is based upon one of the best traits of human nature, sympathy for one's fellow man. Sympathy is one of the noblest emotions, but it is apt to exaggerate visible evils and be pessimistic. It says, "There is a poor workman thrown out of a job, the bread is taken out of his mouth, and he and his family are left to starve." It has no use for unemotional history, statistics, logic, and common sense, which all tend to the more optimistic view, that whenever a machine or a method of operation causes a piece of work to be done by fewer men, throwing some men out of employment, the money saved by reducing the cost of the work constitutes a fund which does not remain idle in the bank, but is used to give other employment to the same or to other men.

It is an axiom among men that have given thought to the subject that the work to be done in the world is not limited except by the facilities for doing it, and by the money available for paying for it. If the Bethlehem Steel Company saved $75,000 a year by throwing a large number of shovelers out of a job, it had that much more money to spend in other departments. Just as much ore was shoveled as before, and the $75,000 went into paying labor to add to the world's store of machinery or other desirable products.

As long as the shoveling to be done in the world is done by inefficient men working with imperfect picks and shovels and wheel barrows, the amount of shoveling that can be done is limited. Double the efficiency of each man by selecting the men and improving the tools, multiply the efficiency by 10 or by 100, by the use of steam shovels, car unloaders and mechanical conveyors, and it becomes possible to straighten the curves of our railroads, and to dig the New York State barge canal and the Panama Canal. Improve the efficiency of the man or the machine, and immediately there is more work to be done, more money to pay for having it done, and higher wages paid for doing it. All of this, to men acquainted with the facts, is the merest truism, but it seems just as hard to get the average workman to believe it, as it was in the days when stage drivers were thrown out of employment by the locomotive. Industrial progress is still resisted by the workmen whom it most largely benefits.

Scientific management must expect for many years to meet the same opposition that met the introduction of machinery to supplant hand labor. But the progress can only be delayed, not prevented, by such opposition. The workmen will not be converted by logic or argument to believing in the new methods, but their opposition will gradually die out, as they find by actual practice that it is benefiting them and giving them higher wages than they ever before received.

C. W. MIXTER: The premium system of paying wages, with standard allowed times set high and considerably removed from minimum necessary times which last are not accurately known, is no part of real scientific management. Under scientific management with the task and bonus method of paying wages (the times determining the tasks being set low and accurately ascertained by means of unit-time studies) the occurrence which Professor Commons has just described, of making a new set of standard times under the stress of competition, could not possibly take place. The premium system, notwithstanding its form, is really a compromise modification of the old worn-out piece rate system; it is virtually a system of piece rates "cut in advance." That is to say, as a workman reduces his time under premium wages, his pay reckoned as per piece automatically comes down lower and lower. No wonder, therefore, that many workmen are beginning to oppose it and there was a strike against it at the Watertown Arsenal. The system of scientific management has to be thoroughly introduced, and all its parts made consistent with each other, or it is a failure and no scientific management at all.

With respect to what Professor Commons has just said about the monotony of work under modern high specialization in work, that is a question wholly aside from scientific management. Work is work, and there is no help for it, but that it should be monotonous under present day conditions and the probable conditions of the future. The remedy is to organize the life of working people outside their work hours and to shorten the number of work hours per day. This last is a reform which must come soon and will be hastened by reason of scientific management. With shorter hours, better pay, more education, and an enriched social life outside the factory and the shop,—then your working girl while at work will have something even better to think of than fairy tales of marrying a prince.

There has been an unfortunate distribution of emphasis thus far in most of the literature on scientific management. The main thing is not the increased efficiency of labor as such and the peculiar methods of paying wages as adjuncts to that increased efficiency. The main thing is the preliminary engineering arrangements and the unheard of labors of organization and guidance on the part of the management, which last makes that increased efficiency of labor not only possible but easy of attainment. All the talk about "speeding up" workmen and wearing them out before their time is wholly mistaken: it is the machines that are speeded up and worn out as early as possible.

Again, owing to the accident of temperament and training of some of the leaders in the movement of scientific management, certain features have been made to appear essential to scientific management that are not at all so. There is no reason whatever why the methods of scientific management should not be carried out in full harmony with trade unions, so far as the recognition of the unions and the paying of wages are concerned, provided the unions will accept the general principles involved.

In reply to a question that has just been asked me, I should say that the determination of wages for the future under scientific management might be as follows: first, the fundamental base time-wage to be fixed by collective bargaining and to vary with the ups and downs of general business and individual competitive conditions; second, the system of graduated bonuses and the standard times upon which the bonuses are based, and the methods employed in fixing these standard times, to be passed upon by the representatives of the workmen who shall be convinced that they are perfectly fair and just and profitable to all concerned.

Once the standard times and the scale of bonuses are scientifically determined and established for any concern, there is no reason of necessity why they should ever be changed. The thing with which you make the necessary adjustments to varying conditions from time to time is the base day rate which the workman is paid anyway whether he earns bonus additional or not. This arrangement recognizes the solidarity of labor so far as it ought to be recognized; but it inserts an individual competitive motive which breaks through the crust of solidarity just where it should be broken—namely, it does away with "limitation of output." Finally, first, last, and all the time, these new arrangements should be worked, and I believe they will be worked, in the proper spirit. The form should be the form of the entrepreneur leadership of industry, but the spirit should be the spirit of coöperation absolutely.

EMILY G. BALCH: I should like to ask what guarantee have we that the efficiency wage will not be cut just as the piece wage has always been cut?

PROFESSOR MIXTER: In reply to Miss Balch I would say that it is one of the leading principles of scientific management to properly distribute rest periods throughout the day, and, when the work is peculiarly arduous, to have extra shifts and helpers. This has been done to some extent already in certain women's employments conducted under scientific management as described in the last chapter of Clark and Wyatt's *Making Both Ends Meet.*

WILLARD E. HOTCHKISS: I regret that the term "scientific management" has become so associated with the idea of getting more work out of laborers. I could cite several instances in which the management of a business having a wide reputation for efficient organization has been found upon, the most cursory investigation by an outside trained investigator, to be based upon anything but scientific principles.

John C. Duncan: The question has been raised as to what is the scientific basis of fixing wage rates. Some one has asked how Mr. Taylor knows that it is unwise to reward a laborer for more than thirty-five per cent of the average day rate while it is all right to put the maximum wages of well trained mechanics at sixty-five per cent more than the average day rate. So far as the speaker knows, the only basis that is followed is experimentation. Mr. Taylor and others have found by actual test that to raise the laborers' wages to more than thirty-five per cent above the daily average does not give a commensurate return for an increase above that point, and for that reason he has fixed his ratio at about thirty-five per cent. The same method of testing has been applied in other lines and with the resulting per cents as stated. There is no investigation made of the man from a physiological or psychological point of view other than these tests, so far as the speaker knows.

Rudolph Seubert: Before I began to take up the study of the Taylor system, I had visited many industrial works in this country, and had the impression that the average American factory organization was not equal to that in my own country.

Germany, by her social laws, protects the laboring man from the exactions of greedy capital. The Taylor system makes up for the public neglect of social questions in this country.

In all the works under scientific management I found that spirit of coöperation, and that marked interest of every worker in his work, which can be attained only where everybody is contented.

The conditions created by a competent application of the Taylor system not only guarantee the workman a higher income than he could earn elsewhere, but also the steadiness and uniformity of methods, time for rest and recreation, a proper subdivision of the work as well as of the responsibility, and every facility possible for every job—"imaginary values," the importance of which, in industrial life, can hardly be overestimated.

It is one of the principles of scientific management to select and to train every man for the job he is best fitted for: the foremen in the shop, and the technical clerks in the planning department are taken from the ordinary workmen.

This shows that it cannot occur that the character or the personality of the man is killed. Only those men are employed for mere physical jobs who are absolutely unskilled; these, however, are not able, and generally even not willing, to do a better class of work.

Scientific management has been criticised for speeding a man to his grave. It would be bad policy to do this, because one could not hold the men to their jobs. What the Taylor system aims at is to make a man work efficiently, that is, for as long a time as possible. Maximum efficiency is not the same as maximum effort; it is therefore one of the duties of the time study expert, under the Taylor system, to find out what the proper proportion between rest and work is for each kind of work, and to set the time for each task accordingly.

It seems to me that one of the greatest merits of Mr. Taylor's system is, to make the man work efficiently and to show him how he can do it without overstraining himself; whereas, on the other hand, I should lose a great deal of the respect which we Germans have for American labor unions if they would encourage that element of human nature which asks for the "highest possible wages for the smallest possible effort," as Mr. Tobin put it.

It would not be just to hold Mr. Taylor's system responsible for the amount of the base rates. These base rates depend on offer and demand, and, in the works under scientific management which I have visited, are the same as in the vicinity: that is, in the neighboring shops which do the same kind of work. The bonus rates, however, are methodically determined upon as a share of the profit which is obtained for the employer by the employee doing the work in the time and manner set, and are not, as some people think, based on a guess.

These bonus rates are the incentive which induces the man to carry out the instructions given to him, and although it is theoretically possible to cut these bonus rates, it would be very unwise to do it. It has been done at the Midvale Steel Works, with the result that the men did not consider the new rates a sufficient "bait" to follow their instructions, and, as a consequence, the output decreased to such an extent that the management gladly raised the bonus rates to their former amount.

The improvements for all men working under Mr. Taylor's system make me believe that scientific management is a long step forward on the way toward the solution of social questions.

F. L. Hutchins: I have listened with much interest to what has been said here, but it seems to me that we have been missing the real spirit of the question before this conference.

The first speaker laid emphasis upon the fact that the cost of a certain article had been reduced from $1.04 to 58 cents, and the representative of labor insists that the aim should be to get as much as possible for the least amount of effort.

Efficiency only incidentally has to do with wages paid or earned. It has mainly to do with management. Its main tenets are directed towards the executive. What else can the common term "scientific management" mean?

Greedy managers will continually strive to get the most that they can for the smallest wage; workers will continually retaliate by giving as little as they can for the highest wage they can force. No scheme of wage payment, be it piece rate, premium, or bonus will eliminate this fundamental conflict.

The principles of efficiency apply entirely to management; it is up to the executive to see that conditions are right; that methods of working are the best that can be devised; that efficient planning is obtained.

The great majority of workers are fair; they believe in the efficiency principle of a "square deal" and given right conditions and right treatment, they will invariably respond with all that is in them.

But beyond and beneath all this superficiality is the resistless evolution that is to create new methods in the supplying of social needs. The community of today is analagous to the prehistoric man, who had to supply all of his demands by his own unaided effort. The endless changes of evolution have brought about that diversity of effort, which today makes every individual dependent upon other individuals; but the community as a whole still does its own work, plants its own fields, raises its own crops, transports itself and its products to suit its needs. In the last analysis each individual is working, not for himself, but for the community of which he forms a part. As with the prehistoric individual, the community is now striving to satisfy its demands with the least amount of effort, and this is in line with the labor demand of the greatest wage for the least effort, with this difference that the community says product.

The worker would also see that product is the thing, were there an equitable distribution of product among those who conspire to produce it. Here is the fundamental basis for the conflict between employer and employed.

It has been my fortune to watch the progress during the past fifty years and I think that I can see something of the underlying causes leading up to present conditions.

First I blame the public school system, in that it has been used for a wrong purpose. Often in my younger days have I heard parents say that they were sending their boy to school that he might not have to work as they had done. With this end in view it is natural that the result should have been to produce keen minds looking for the main chance, unbalanced by any education as to their duty to society as a whole. These, let loose to prey upon the community, found their opportunity in the period immediately following the Civil War. Managers were developed who could get results, not for the community, but for themselves or for their companies, one of the preëminent qualifications being the ability to handle labor,—that is, the ability to get the utmost from the laborers for the least pay, and still avoid strikes or other troubles.

The gradual forging into executive positions of such men as these made the labor union an absolute necessity; and whatever is bad in such unions is the direct reflex of grasping, domineering executives, who ignored their duty to the community as a whole.

There are abundant evidences that such management is in its decline; that such managers are no longer wanted; the evils suffered by reason of such management are making themselves felt and there is a turn toward a more rational coördinating of effort.

Here, it seems to me, is the function of the new cult of "scientific management"; it emphasizes the square deal, the use of common sense, the making conditions most favorable to the worker, the educating of the laborer to produce more with less effort; it insists that the laborer is worthy of his hire and that as he produces so should he be rewarded. May it not be one of the means towards the ultimate end when those serving the community shall receive remuneration in accordance with production and not for time used or misused? The payment of wages according to elapsed time is a very recent invention and in present development can last but a short time longer. The discussion here this afternoon, hanging upon the question of wages, is touching only the most superficial elements of the relationship between efficiency and industrial labor.

The effect of "scientific management" is to develop a new type of manager; one who will recognize his duty to the community to produce the most possible with least effort; and who also will recognize that the laborers are the largest part of that community and are entitled to receive their equitable share of the results of their labor.

HARLOW S. PERSON: My understanding of what Scientific Management is, made more definite by the inspection of plants in which its principles have been applied, leads me to disagree with many of the opinions which have been expressed this afternoon. I propose to consider briefly each of nine criticisms which have been made.

1. The making of time-studies and the setting of tasks is uncomplimentary to labor. General Crozier has answered this criticism; management is studied as thoroughly as is labor and is also set tasks. In applying scientific management a long period is devoted to the study of management before a study of labor is begun. Under that form of management labor is in a position to hold management to the proper performance of its tasks, just as management is able to hold labor to a proper performance of its tasks. There is no invidious distinction. Perhaps, however, in expositions of scientific management too much has been said about organizing the mechanical processes and too little about organizing the managerial processes.

2. The work of the laborer becomes uninteresting, monotonous, and more than ever makes him a mere machine. This conclusion is not in accord with the facts one observes in plants so organized. It rests on three false assumptions: that taking from the laborer the necessity of going after his material, tools, etc., takes from him the interesting part of his work; that inefficient methods are more interesting than efficient methods; that methods determined by experiment and taught the laborer are less interesting than those which have come to him as tradition.

3. Scientific management will speed up, wear out, and cast

aside the laborer. This conclusion also is not in accord with the facts. To one who visits a plant where it has been applied, the immediately impressive fact is that there is no sign either of haste or of idleness. The laborer no longer soldiers, but he does not work strenuously. He works skilfully and applies his energy more efficiently. He does not have to wait between jobs for material and for tools, and that is one of the great sources of saving; it does not mean however that the jobs are crowded upon him in a way to make the work strenuous. Reasonably constant application and dexterity are the conspicuous things; not speeding up.

4. Under the new form of management a spying system is inaugurated, and mutual distrust among laborers and a lack of *esprit* are developed. I am not sure that I comprehend what is meant by "spying system." The relationship is between laborer and planning room, not between laborer and laborer. If a workman is derelict in performing his task, it does not become the duty of another workman to discover that fact and complain on him; the management becomes automatically instantly aware of it, inquires into the cause, and relieves the situation. The spirit actually found to exist in plants where scientific management has become well-established approaches enthusiasm.

5. Scientific management is not generally applicable because of the mobility of labor; to secure efficiency by teaching the laborer more efficient methods requires that he remain with a firm longer than the average laborer remains. This criticism premises a mobility which the organizing engineer and the manufacturer do not ordinarily experience. On my way to this meeting I visited a plant in which scientific management is being applied; I asked the superintendent how long his workmen remain with him on the average; he told me eight years, and added that the average had increased since the new system of management had been applied. The increased wage under scientific management is attractive to the workman; the longer he remains the more he learns to earn, until he reaches a constant so much above the average wage of his class that he cannot be drawn away.

6. Just as piece rates have been cut in the past, so the differential rates which become established for a given task may be cut. This is a more reasonable criticism. It may become

possible to cut the rates, but I believe that the probability is against it. First; employers themselves have come to look upon rate cutting as one of the great blunders of the past; the majority of them have learned to fear the consequences. There is no more fundamental principle of organizing engineers than the principle that rates must never be cut. Second; piece rates have been established in the past without any exact basis and in many instances rate cutting has resulted from the discovery that they had been wrongly established. Under scientific management a rate is never established until exhaustive experiment has determined what it should be. Third; the principal cause of rate cutting in the past has been the invention of a new and more efficient machine to perform an operation the rate for which has been established on the displaced machine. With the introduction of such a new machine into a competitive industry, those employers paying piece-rates are put at a fatal disadvantage; those employers pay hour-rates secure a tremendous advantage; it becomes with the former a case of cut rates or fail in business. Now under scientific management a rate is established for every separate combination of the four variables, man, machine, material, and job; and when any one of the last three changes a new rate is established. Furthermore, there is never any incentive to cut on the ground that a workman earns too much relative to the employer's profits; unit cost always decreases as the laborer's earnings increase. If the time ever comes when all plants apply scientific management and none enjoys a differential advantage, then a cut of rates may be more probable. But it will be no more probable than a cut of hour rates under the same conditions.

7. The increased productivity under scientific management will cause unemployment of labor. I do not refer to the untenable assertion that such will be the ultimate result. But in a given plant or in a given industry there may result (during the period of readjustment) temporary unemployment. In making this criticism the critic has in mind the industrial revolution. But one little point of difference in the cases destroys the analogy. Power and textile machinery were put upon the market in great quantities, standardized to fit all plants. Systems of management can never be put upon the market in that way. No two cases of organization present the same problems; each requires

years instead of days; and the organizing engineers capable of applying the principles of scientific management so effectively as to secure greater productivity will always be few. There can never be any sudden widespread unemployment. There are occasionally a few cases of unemployment in connection with each case of reorganization, but these are so few that the workmen are easily reabsorbed into the industry.

8. Labor is not allowed to help determine its rate of remuneration. This criticism is true as to fact, but the fact is not significant. Labor has not yet asked that privilege. Scientific management has raised the rate of wages previously existing in those institutions in which it has been applied. The laborer has been voluntarily offered a wage greater than he has been accustomed to demand. If the laborer should ever demand the right to help fix the rate, there is nothing in scientific management to prevent; there is no reason why, through a properly chosen and competent board, he should not help make time-studies, determine the task, and fix the shares of the employer and himself.

9. Scientific management will destroy the solidarity of unionism. That does not seem to be a reasonable expectation. If the solidarity of unionism depends upon equal pay to all workmen irrespective of ability, then unionism and scientific management cannot exist together. But I do not believe that unionism is dependent upon that one thing. There is nothing in scientific management to prevent its recognizing unionism. There is nothing fundamental in unionism to prevent its recognizing differential wages. It is possible to conceive of the time when the management and a board from the union shall together make the time-studies, set the task, and determine the differential rate; and then the board turn to the members of the union and say, "The rate is just, earn according to your respective abilities." Under scientific management one element of trouble in the bargaining between management and labor, a lack of knowledge of the facts, would be absent. Scientific management determines with extraordinary exactness the facts of production under any given conditions. Labor when it knows the facts is reasonable.

In this connection I should like to call attention to a significant little book which has just come from the press,—*The Laws of Wages*, by Professor Moore, of Columbia University. One cannot accept the laws and the corollaries presented in that work without being forced to believe that the self-interest of labor requires that it use the power of its unions to put pressure upon management to increase in every way the efficiency of plant and organization.

The statement has been made that there is danger from fake organizing engineers. I do not believe that that can be considered a criticism of scientific management, but the danger is so real that I emphasize it by referring to it. The men who can without friction change a plant from the usual form of organization to that required by the principles of scientific management will always be rare; they must of course have an accurate knowledge of industrial processes, but in addition to that, and perhaps more important, they must have largeness of vision, a capacity for detail, and infinite patience, tact, and sympathy.